

**Notice of Allowability**

Application No.

10/528,847

Applicant(s)

HOSHINO ET AL.

Examiner

Art Unit

Iqbal H. Chowdhury, Ph.D.

1652

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 2/27/2007.
2. ☒ The allowed claim(s) is/are 1,3-11 and 50-55.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some\* c) ☐ None of the:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |  |  |
|--|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892)   | 5. <input type="checkbox"/> Notice of Informal Patent Application                                |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____ |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),<br>Paper No./Mail Date _____    | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment                              |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance             |
|  | 9. <input type="checkbox"/> Other _____  |

## **DETAILED ACTION**

### ***Application Status***

In response to a previous Office action, a non-final requirement (mailed on September 26, 2006), Applicants filed an amendment on February 27, 2007, amending claims 1, 3-4, 8-11, canceling claims 2, and 12-49, and adding new claims 50-55 is acknowledged.

A new abstract has been rewritten and is attached in a separate sheet herewith.

Applicants' arguments filed on February 27, 2007, have been fully considered and are not deemed to be persuasive to overcome some of the rejections previously applied. Rejections and/or objections not reiterated from previous office actions are hereby withdrawn.

## **EXAMINER'S AMENDMENT**

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Charles M. Avigliano, the representative of the instant application on June 27, 2007.

### **Amend claims as follows:**

Replace "Claim 1" with "Claim 1. An isolated polynucleotide isolated from a microorganism comprising a nucleic acid molecule selected from the group consisting of:

(a) nucleic acid molecules encoding the polypeptide depicted in SEQ ID NO:3;

(b) nucleic acid molecules comprising the coding sequence as depicted in SEQ ID NO:2;

(c) nucleic acid molecules encoding a polypeptide whose sequence has an identity of 99% or more to the amino acid sequence of the polypeptide encoded by a nucleic acid molecule of (a) or (b) having acetyl-CoA carboxylase activity; and

(d) nucleic acid molecules encoding a polypeptide derived from the polypeptide whose sequence has an identity of 95% or more to the amino acid sequence of the polypeptide encoded by a nucleic acid molecule of (a) or (b) having acetyl-CoA carboxylase activity, wherein said nucleic acid is isolated from *Phaffia*.

Replace "Claim 3" with "Claim 3. The isolated polynucleotide of claim 1, wherein said polynucleotide encodes the amino acid sequence of SEQ ID NO: 3 or has identity of 99% or more with SEQ ID NO: 3".

Replace "Claim 4" with "Claim 4. The isolated-polynucleotide of claim 1 wherein said polynucleotide is isolated from a strain of *P. rhodozyma* or *Xanthophyllomyces dendrorhous*".

Replace "claim 6" with "Claim 6. A recombinant vector comprising the polynucleotide of claim 1".

Replace "Claim 8" with "Claim 8. A method of making a recombinant microorganism comprising introducing the vector of claim 6 into said microorganism".

Replace "Claim 9" with "Claim 9. The method of claim 8, wherein said microorganism is selected from *E. coli* or *S. cerevisiae*".

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Replace "Claim 11" with "Claim 11. A process for producing a polypeptide having acetyl-CoA carboxylase activity comprising culturing the recombinant microorganism of claim 10 and recovering the polypeptide from the culture of said recombinant microorganism".

In Claim 53, line 1, replace "polynucleotide sequence" with "polynucleotide sequence from *Phaffia*".

In Claim 54, line 2, replace "95%" with "99%".

***Allowable Subject Matter***

Claims 1, 3-11 and 50-55 are allowed.

***Reasons for Allowance***

The following is an examiner's statement of reasons for allowance: The applicant has claimed an isolated polynucleotide of SEQ ID NO: 2 encoding a mature form polypeptide of SEQ ID NO: 3, wherein said polynucleotide is isolated from a strain of *P. rhodozyma* or *Xanthophyllomyces dendrorhous*, a recombinant vector comprising said polynucleotide, a method of making a recombinant microorganism comprising introducing said vector into said microorganism and a process for producing said polypeptide having acetyl-CoA carboxylase activity comprising culturing the recombinant microorganism and recovering the polypeptide from the culture of said recombinant microorganism. In view of Applicants' claim amendments and Examiner's amendments, all prior rejections are withdrawn. The prior art does not teach an isolated polynucleotide of SEQ ID NO: 3 encoding a polypeptide of SEQ ID NO: 2, which has acetyl-CoA carboxylase activity. A standard search did not produce any prior art that suggests or teaches the claimed invention. The claimed invention is novel and nonobvious over the prior art.

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Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Iqbal Chowdhury, Ph.D. whose telephone number is (571) 272-8137. The examiner can normally be reached on Monday-Friday from 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ponnathapura Achutamurthy, can be reached at (571) 272-0928.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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**Abstract:**

The present invention relates to a gene useful in a process to increase the microbial production of carotenoids. The carotenoids astaxanthin is distributed in a wide variety of organisms such as animals, algae and microorganisms. It has a strong antioxidation property against reactive oxygen species. Astaxanthin is used as a coloring reagent, especially in the industry of farmed fish, such as salmon, because astaxanthin imparts distinctive orange-red coloration to the animals and contributes to consumer appeal in the marketplace.